

MATLAB BASED LOCATION IDENTIFICATION WITHOUT USING GPS

Italia Hiren R.

Electronics and Telecommunication Department, University of Mumbai
Vishwatmak Om Gurudev College of Engineering, Aghai, Tal.- Shahpur, Dist.- Thane, Maharastra.
hiren.italia@gmail.com

ABSTRACT:

The main aim is to design and develop an automatic location identification system using the speech processing system with the Matlab interface in the real time environment. Cell phones will be taking a new role, beginning a slow transition to becoming user tracking devices. The outcome of this shift reassures some, but has others calling for restrictions on how cell- locating information can be used. The major thing of this paper is to do tracking of a GSM mobile which are having symbian3 as their operating system. This process of tracking is introduced so that without buying any GPS system we can locate the location. Unlike GPS, here the location of the tower is being found under which the mobile whose location is to be found is working.

Keyword: GPS, Location Identification, MATLAB

1. INTRODUCTION

We are writing the program using the Matlab in such a way that, when the user speaks, it will recognize the word and then it will send the data to the micro controller using the serial port interface. At the other end the micro controller will read the data and send the same to the GSM modem using the Nokia AT Commands. As soon as the SMS is sent, it will then wait for the reply. The cell phone to which the SMS has been sent has a Symbian OS present in the cell, such that as soon as it gets the SMS, the software in the cell will then automatically read the current location of the cell ID and then it will send the ID back to the GSM modem immediately. As soon as the micro controller gets the SMS, it will then display the same on the LCD, so that the user can get to know the exact location of the person carrying the cell in the real time environment. This technology can be implemented in school/college buses, in military and can also be used private things etc.

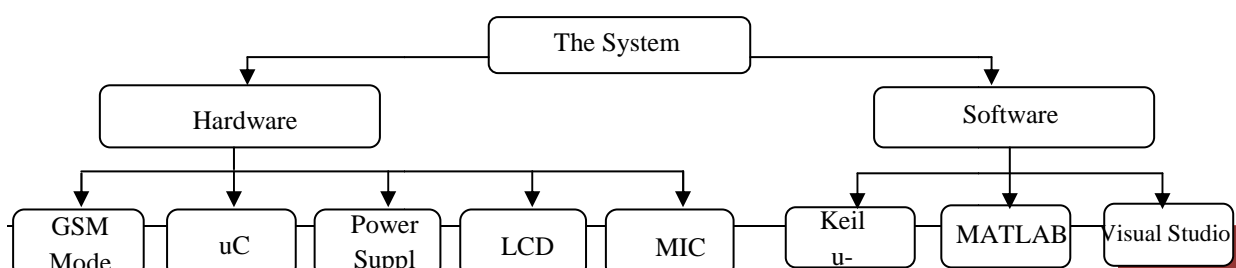
2. BACKGROUND OVERVIEW

In today's world, the location of the mobile phone is found using the GPS system. But all the mobile phones does not support the GPS facility. One can find the position of a man who is telling lie without being known to him/her. When used as security purpose it is again helpful. If they will be provided with such mobiles they can be find out. Earlier it was being used by GPS but if we do the same by GPS the person can know. To design an instrument without using GPS for detecting the location with the help of GSM and using MATLAB for security reasons. For this we will be taken help of microcontroller, Matlab, Symbian, visual C++, and GSM model. For this, a coding has to be written as the sis file which will be put in the mobile whose location is to be found. To check whether this design suits in the modern world or does it has the capability to sustain today. And, if it finds its space in modern world it can be implemented for future.

3. THE PROPOSED SYSTEM

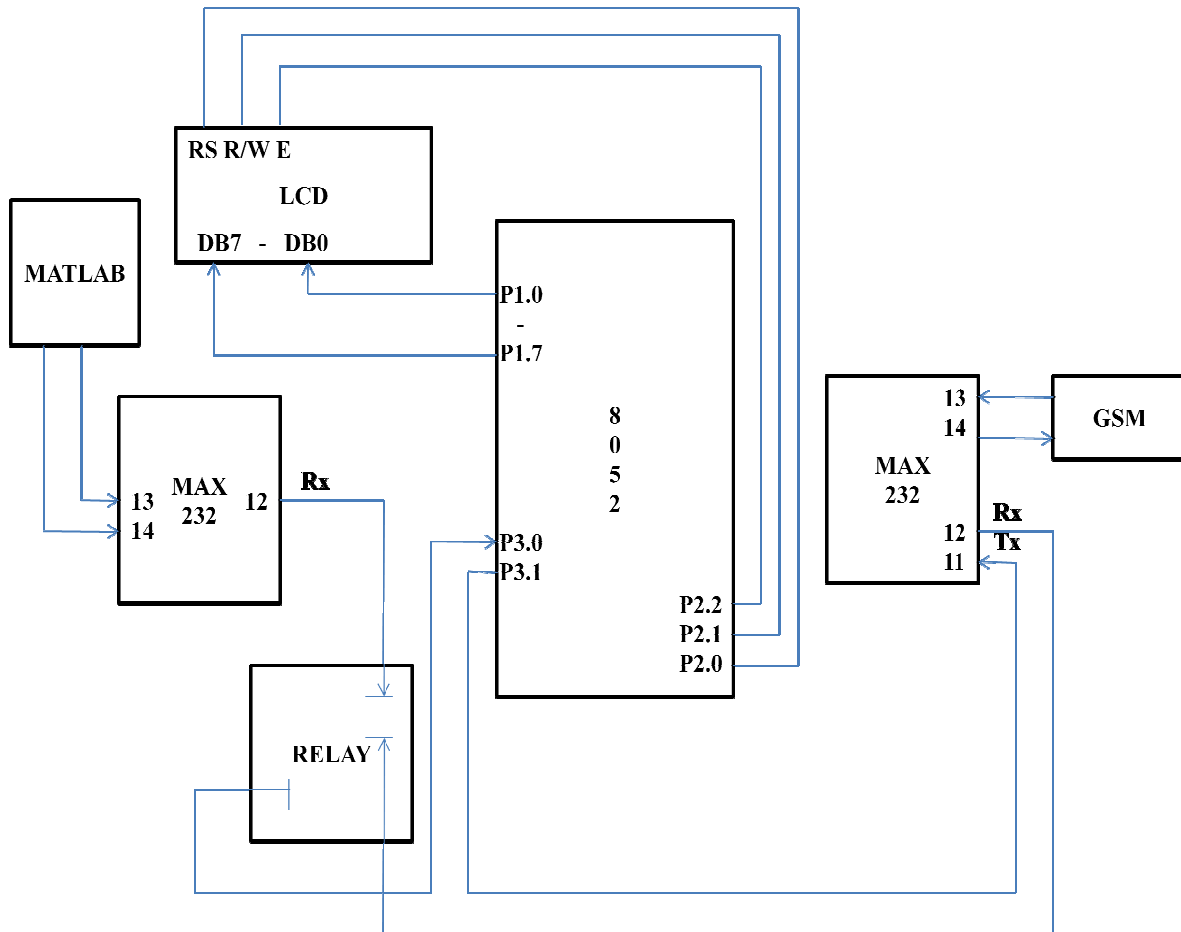
3.1 System Requirement:

The above proposed system will be divided into the following sub modules or sections...



3.2 Experimental Setup:

The Basic Experimental Block Diagram of the system is given below.



3.3 Explanations of Blocks

The following are the brief explanations of the working principle of the various major blocks or sections used in the system...

- **Power Supply**

This unit will supply the various voltage requirements of each unit. This will be consists of transformer, rectifier, filter and regulator. The rectifier used here will be Bridge Rectifier. It will convert 230VAC into desired 5V/12V DC.

- **Microcontroller**

This unit is the heart of the complete system. It is actually responsible for all the process being executed. It will monitor & control all the peripheral devices or components connected in the system. In short we can say that the complete intelligence of the project resides in the software code embedded in the Microcontroller. The controller here user will be of 8051 family. The code will be written in Embedded C and will be burned or programmed into the code memory using a programmer.

This unit requires +5VDC for it proper operation.

- **MAX 232**

This section will be used to convert TTL logic into RS232 logic and vice-versa. In TTL---logic 1 is +5V and logic 0 is 0V. In RS232---logic 1 is -10V and logic 0 is +10V. This unit will provide interface that is required to communicate microcontroller with RS232 based devices using serial communication link. The MAX232 IC is dedicated for the logic conversion. This unit is also called as Logic Converter OR Level Converter.

This unit requires +5VDC for its proper operation.

- **Relay**

Relays allow one circuit to switch a second circuit which can be completely separate from the first. Relays are usually SPDT or DPDT but they can have many more sets of switch contacts. This section is used to choose the input to the Microcontroller from MATLAB or from GSM modem.

- **LCD**

This section is used to display the location of the mobile phone which is found by the GSM modem. Here I am using 16 X 2 LCD. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix.

- **PC**

PC is used to develop the application in MATLAB for the recognize the user voice and send the message to the GSM modem from the data stored inside the MATLAB system.

4. PROJECT DEVELOPMENT METHODOLOGY STEPS:

The following will be development steps so as to achieve the working Prototype Model of the above proposed system...

- Defining the Problem,
- Understanding the Need & Usability in industry and society (Market Analysis),
- Developing Block Diagram,
- Designing Circuits of individual blocks,
- Testing circuits in LAB & Finalizing,
- Developing PCB on PC,
- Getting the PCB printed from market,
- Soldering the components,
- Performing various Basic Experiments to test the PCBs,
- Developing Flowchart for the entire process,
- Writing actual Software Program,
- Compilation & Burning,
- Testing and Debugging,
- Writing actual code.
- Finally Running the system and,
- Documentation.

5. TECHNOLOGY & PROGRAMMING LANGUAGES:

As microcontrollers are the core of these days digital circuit design in industry, this system uses it for the centralized operation and digital processing. The technology used here is embedded technology which is the future of today's modern electronics.

The followings are the various Programming Languages & Technologies that are going to be used in the proposed system...

For Embedded System...

- Embedded Technology,
- 8051 Family Based Controller,



- Embedded C - Keil Compiler,
- SPI Protocol for GSM modem interfacing,
- Eagle Software for PCB Designing,

For PC System...

- Visual Studio 6.0 Based Application Software,
- Serial Communication Protocol,
- MATLAB based Software,

6. SCOPE AND APPLICATION

Only the imagination can limit the applications of the above proposed system. Though the following are some examples...

- Find location of person,
- Find out the lie of the person about the place.

7. CONCLUSION

This project has been developed for knowing the location of a GSM mobile equipped with symbian operating system without using GPS. It has been developed so that location of a mobile can be found using the available resources (as GSM here) so that we won't have the need for any GPS. Here, we have used softwares like keil µvision, MATLAB, visual C++. Also, hardwares like microcontroller, GSM modem, MAX232, power supply etc. has been used. Every software and hardware has its own purpose. As MATLAB is used for security reasons so that our instrument can't be used by someone who is not authorized. Its purpose is to recognize the voice of the authorized person and then to signal the microcontroller for requesting the GSM modem to send the message for location. Modem will send the message to the mobile whose location is to be found. And, there is an application in the mobile which will fetch and send the location to the modem which will be shown on LCD through the microcontroller. Visual C++ is for writing the code for symbian application. MAX232 has been used for conversion between RS232 and TTL logic. The relay is for switching purpose. Work is going on implementing the same idea onto the platforms other than symbian. If it gets success then it will be useful as it doesn't need any GPS, MAP or any kind of internet connection.

8. ENHANCEMENTS

8.1 Limitations

As generally all systems have some limitation, here are some listed for the proposed system...

- Cannot find the exact location.
- Hardware must require on sending side.

8.2 Drawbacks

This system has certain drawbacks also as listed...

- Uses of Bluetooth for transmission from mobile to hardware,
- Speed of location detection is slow.

8.3 Future Modifications

There is always chance to improve the any system as research & development is an endless process. Our system is no exception to this phenomenon. The following improvements can be done...

- Can be find exact location,
- Data transfer rate can be increased,
- Can be integrated in device itself.

REFERENCES

- [1] http://en.wikibooks.org/wiki/Serial_Programming/MAX232_Driver_Receiver
- [2] <http://www.kpsec.freeuk.com/components/relay.htm>
- [3] <http://shaunak.ws/journal/building-regulated-5v-dc-power-supply>
- [4] <http://www.apollodisplays.com/pdf/dmcmman.pdf>

- [5] http://www.atmel.com/dyn/resources/prod_documents/doc1919.pdf
- [6] http://www.4shared.com/document/1BqsWuRj/The_Microcontroller_8052_basic.html
- [7] <http://www.scribd.com/doc/21547039/GSM-Protocol-Architecture>
- [8] http://nds1.nokia.com/phones/files/guides/Nokia_AThelp.pdf
- [9] http://nds1.nokia.com/phones/files/guides/22_list_of_at_commands_en.pdf
- [10] <http://symbianresources.com/tutorials>
- [11] A new method for cell ID assignment for Distance based location management in cellular communication systems. This paper appears in: Information and Communication Technologies: From Theory to Applications, 2008. ICTTA 2008. 3rd International Conference on
Issue Date: 7-11 April 2008
- [12] Experimental validation of a MATLAB based control architecture for multiple robot outdoor navigation. This paper appears in: Intelligent Control, 2005. Proceedings of the 2005 IEEE International Symposium on, Mediterrean Conference on Control and Automation
Issue Date: 27-29 June 2005
- [13] Mullet, Wireless Telecom System and network, Thomson Learning 2006.

AUTHORS BIOGRAPHY

Italia Hiren R. was born in Surat, Gujarat, India on November 14, 1989. He received the B.E. degree in Electronics and Communication Engineering from Visvesvaraya Technological University, Belgaum, Bangalore, Currently pursuing M.E. degree in VLSI and Embedded Systems from University of Pune and since last one and half year working as lecturer in Vishwatmak Om Gurudev College of Engineering, Aghai, Maharastra.

